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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,641	03/29/2004	Ryo Furukawa	1640.1024	9580

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EXAMINER	
HAJNIK, DANIEL F	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/810,641	FURUKAWA ET AL.	
	Examiner	Art Unit	
	Daniel F. Hajnik	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Color photographs and color drawings are not accepted unless a petition filed under 37 CFR 1.84(a)(2) is granted. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the following language as the first paragraph of the brief description of the drawings section of the specification:

> **The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.**

Color photographs will be accepted if the conditions for accepting color drawings and black and white photographs have been satisfied. See 37 CFR 1.84(b)(2).

Claim Rejections - 35 USC § 103

1. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malik et al. (NPL Document, "Recovering Photometric Properties of Architectural Scenes From Photographs", herein referred to as "Malik") in view of Marchant et al. (NPL Document "Shadow-invariant classification for scenes illuminated by daylight", herein referred to as "Marchant").

As per claims 1, 2, and 3, Malik teaches the claimed "obtaining a 3D geometrical model expressing a 3D form of an object by using geometrical information" by teaching of "a geometric model of the architecture" (3rd paragraph under section 1).

Malik teaches the claimed "obtaining geographical information including latitude and longitude indicating a position of said object and orientation of the object" by teaching of "The solar position(altitude and azimuth) can be obtained from formula given in the appendix of [18], provided that the latitude and longitude of the site on the earth's surface, and the time and date are known" (1st paragraph under section 3.1).

Malik teaches the claimed "obtaining image data of said object shot with the sun as a light source and correspondence information indicating correspondence between a scene expressed by said image data and said 3D geometrical model as to their positions and forms" by teaching of "we take several photographs–of the sun, the sky, the architecture, and the environment surrounding the architecture" (3rd paragraph under section 1) and by teaching of "We take multiple photographs at different times and viewing directions(Figure 5), such as grazing angles, directions close to mirror angles of the solar positions and other directions, to sample the radiance distribution from the architecture" (1st paragraph above section 4.2.1).

Malik teaches the claimed "obtaining shooting information including information on a shooting time and shooting situation of said image data" by teaching of "Photographs are taken for the sun, the sky, the landscape, as well as the architecture at a few different times of day to collect enough data for recovering the various lighting and reflectance models" (abstract).

Malik teaches the claimed "placing said 3D geometrical model in a predetermined local coordinate system based on said geographical information" by teaching of "we have the following reflection model expressed in a local coordinate

system of each triangular patch" where the 3D geometrical model uses one or more reflection models.

Malik teaches the claimed "calculating a light source direction in said local coordinate system by using said geographic information and said shooting time" by teaching of "the sun as a directional light source" (3rd paragraph under section 5.2) and by teaching of "the different positions of the light source are generated by the movement of the sun during the day" (3rd paragraph under section 5.2).

Malik teaches the claimed "detecting a shadow region cast on a surface of said 3D geometrical model by a beam in said light source direction by using said light source direction so as to identify the shadow region of said image data based on said correspondence information" by teaching of "When large shadows are inavoidable, we can interactively label the shadow boundaries to separate sunlit regions from shadowed ones" (1st paragraph above section 4.2) where labeling boundaries would require a least some knowledge of where they are located (through detection).

Malik teaches the claimed "using a predetermined reflection model to estimate effects of shadings caused to said 3D geometrical model by the beam in said light source direction" by teaching of "The reflectance models are for the surfaces of the architecture" (abstract) and by teaching of "we proposed a method to extend image-based modeling and rendering techniques to deal with producing renderings under novel lighting conditions" (1st paragraph under section 7).

Malik teaches the claimed "determining a parameter of the reflection model suited to said estimated shading" by teaching of "to solve a series of optimization

problems to find the parameters of appropriate lighting and reflectance models" (abstract).

Malik teaches the claimed "fit ... to said 3D geometrical model" by teaching of "fit empirical or physics-based models to measured data and then using the obtained model into illumination calculation" (1st paragraph under section 4)

Malik does not explicitly teach the claimed "performing calculation for removing the effects of the shadows and shadings by using said parameter from pixel values samples from said image data based on said correspondence information". Marchant teaches the claimed limitation by teaching of "What we do hope to remove are large shadows caused, for example, by vehicles, equipment, and people near the images" (1st full paragraph in 2nd col on pg. 1959) and by teaching of "This means that effects due to shading will be removed" (last paragraph in 2nd col on pg. 1954).

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Malik and Marchant. One advantage to the combination is provided by Marchant, which teaches of "Shadows are often seen as a nuisance in images and are dealt with by use of image processing techniques" (last paragraph in 2nd col on pg. 1952) and by teaching of the need to "achieve color constancy in the presence of shadows" (1st paragraph on pg. 1953). Malik teaches the desire for the functionality to remove shadows by teaching of "we proposed a method to extend image-based modeling and rendering techniques to deal with producing renderings under novel lighting conditions" (1st paragraph under section 7) where novel lighting conditions may be achieved easier by removing shadows using Marchant.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Please see form 892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Hajnik 1/16/06

DFH

U Chauhan
ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER